A. Cover Sheet *(Attach to front of proposal.)*

1. Specify: ☒ agricultural project or ☐ urban project ☒ individual application or ☐ joint application

2. Proposal title—concise but descriptive: Service Area 4 Distribution System Improvement Project

3. Principal applicant—organization or affiliation: Lost Hills Water District

4. Contact—name, title: Phillip D. Nixon, Manager

5. Mailing address: 3008 Sillect Ave., Suite 205 Bakersfield, CA 93308-6340

6. Telephone: (661) 633-9022

7. Fax: (661) 633-9026

8. E-mail: lhwdphil@aol.com

9. Funds requested—dollar amount: $ 1,177,600.00

10. Applicant cost share funds pledged—dollar amount: $ 195,800.00

11. Duration—(month/year to month/year): June 2001 to April 2002

12. State Assembly and Senate districts and Congressional district(s) where the project is to be conducted:
Assembly District 30 (Dean Florez), Senate District 16 (Jim Costa).
Congressional District 20 (Cal Dooley)

13. Location and geographic boundaries of the project:
Within Lost Hills Water District in Northwestern Kern County, Sub-Region 19.

14. Name and signature of official representing applicant. By signing below, the applicant declares the following:
— the truthfulness of all representations in the proposal;
— the individual signing the form is authorized to submit the application on behalf of the applicant;
— the applicant will comply with contract terms and conditions identified in Section 11 of this PSP.

Phillip D. Nixon, Manager *(printed name of applicant)*

2-15-01 *(date)*

Phillip D. Nixon *(signature of applicant)*

Section B – Scope of Work

RELEVANCE AND IMPORTANCE

Part B-1: Abstract

The proposed project consists of concrete lining approximately 3.0 miles of existing unlined canals in Lost Hills Water District's Service Area 4. The canals proposed to be lined include Canal 4N and Canal 4S. LHWD is located in northwestern Kern County, within the boundaries of Sub-Region 19 as defined by the CALFED program. The purpose of the proposed project is to prevent seepage losses to a saline shallow groundwater table. Seepage data collected by the District and analyzed by Provost & Pritchard Engineering Group, Inc., indicate that canal lining of Canal 4N and Canal 4S would save approximately 250 acre-feet of water per year that is lost to a salt sink. The project is consistent with the Intended Outcome of Completed Quantifiable Objective Number 188 for Sub-Region 19, that being to "decrease flows to salt sinks to increase the water supply for beneficial uses". Figure 1 in the Appendix is a map of the District and shows the location of the proposed project.

Part B-2: Background Information and Need for the Project

The Lost Hills Water District was formed on February 8, 1963, pursuant to Division 13 of the California Water Code, for the purpose of providing irrigation water from the California State Water Project to land within the District. A water supply contract between Lost Hills Water District and Kern County Water Agency (Agency) was executed on November 10, 1966. The Agency is an umbrella organization that is a State Water Contractor and obtains water from the State Water Project for delivery to its member units. After contract execution with the Agency, the District commenced water deliveries in 1968.

The Lost Hills Water District contains approximately 72,183 acres within its boundaries, beginning at the town of Lost Hills, California and extending north and west to the Kings-Kern County Line. The District lies in the northwest portion of Kern County in the San Joaquin Valley, just west of the Kern National Wildlife Refuge. The District is located within Subbasin 19 as defined by the CALFED program. The California Aqueduct and Interstate 5 bisect the District diagonally. Highway 46 is located at the south end of the District. A map of the District and its service areas is shown on Figure 1 in the Appendix.

Of the 72,183 acres in the District, 70,314 acres are farmable, although not all this acreage is currently being farmed. Approximately 56,000 acres have been farmed on an annual basis over the past five years. Historically, the major crop grown within the District has been cotton, followed in acreage by barley, pistachios, almonds, grapes, olives and alfalfa as well as an assortment of vegetable and additional row crops. Growers within Lost Hills Water District

utilize all three of the major irrigation system types: furrow, sprinkler and micro irrigation. A survey of the irrigation system types used in 1998 yielded the following results: micro-irrigation 17,640 acres (31%), sprinkler irrigation 23,940 acres (42%) and furrow irrigation 15,925 acres (27%). The annual crop land that is furrow irrigated has on-farm tailwater return systems installed, and all of the collected tailwater is reused on the same field or routed for use on adjacent fields.

A breakdown of the District acreage in 2001 is summarized below. Contract acres are those acres that have a water supply contract with the District. The remaining farmable land within a service area may be farmed, but the land does not have a water supply contract and the water user must bring water in from outside sources or transfer water from other land.

Service Area	Drainage Zone	Total Acres	Contract Acres
1 & 1R		16,492.12	16,325.72
2	1	6,253.13	6,167.48
3	1	4,697.03	4,664.89
4	1 & 2	6,792.61	6,751.23
5	1	6,123.68	2,804.77
5A	1 & 2	695.90	690.19
6 & E6		15,704.43	9,278.00
6A & E6A	1	6,543.91	114.91
7		4,097.86	1,637.72
8		2,913.61	6.73
9		1,869.11	703.66
Total		72,183.39	49,145.30

Lost Hills Water District primarily supplies agricultural water to growers within its boundaries with a small amount of industrial water delivered annually to oil production and commercial customers. The District supplies no municipal water. The industrial water supplied makes up less than one percent of the District's normal annual water deliveries. All of the water delivered by the District is State Water Project (SWP) water and is delivered to the District through the California Aqueduct. The District's annual entitlement of SWP water is 119,110 acre-feet. In some years, the District is able to purchase supplemental water supplies from the Agency. In above-normal years, Article 21 (Interruptible) water and Turnback water has been available for purchase that can be used to supplement the District's contract supply. In many years, the District is water short and needs to purchase supplemental water. Also, the landowners will periodically transfer water into the District to help meet their crop water requirements.

The District currently owns and operates approximately 12 miles of concrete lined canals, 42 miles of pipeline and 48 miles of unlined canals. Much of the District's delivery system is automated. Lift pump operation and canal and reservoir water levels can be monitored from the District O & M office through

radio telemetry. Check structures and water levels can be adjusted from the office, aiding in operation of the system and virtually eliminating operational spills.

A significant portion of land within the District is affected by saline shallow groundwater. Shallow groundwater in the area is high in salts and some other naturally occurring elements, including Boron and Selenium. Approximately 6,800 acres within the District are currently tile drained and produce subsurface drainwater that is routed to evaporation ponds. The tiled land is primarily located in Service Area 4, although some tiled land is located in the northern area of Service Area 5. The evaporation ponds were installed by private landowners and later acquired by the District. Portions of Service Areas 2, 3, 6 and the remainder of 5 are also subject to some perched water conditions but do not currently have any drainage facilities. All of these areas are within the District's Drainage Service Area Zone of Benefit 1. The tile-drained land is within the District's Drainage Service Area Zone of Benefit 2. The evaporation pond system and the tile-drained area is shown on Figure 1 in the Appendix.

When the District acquired the evaporation pond system from the landowners in 1993, the system was composed of 6 ponds totaling 660 acres. Through drainage reduction efforts, the District has reduced the size of the evaporation pond system in recent years. The District's evaporation pond system is now comprised of only two interconnected evaporation ponds with a total wetted surface area of 345 acres (Ponds 1 and 2). The other four ponds have been closed and removed from regular service. The amount of drainwater discharged to the evaporation pond system has been reduce from a high of 3,831 acre-feet in 1989 to only 1,468 acre-feet in 2000. The District conducts a monitoring and wildlife hazing program at the pond system to comply with the Regional Water Quality Control Board (RWQCB), Department of Fish and Game and other agencies' regulatory requirements.

The Kern County Water Agency prepares Depth to Shallow Groundwater maps each year and includes these maps in their annual Water Supply Report. These maps indicate the extent of shallow groundwater within the KCWA and include the portion of Lost Hills Water District with shallow groundwater conditions. The KCWA groundwater maps coincide with information gathered by LHWD through the District's shallow groundwater monitoring program. Much of the area east of the Aqueduct has a depth to shallow groundwater of less than 10 feet. Historical observation well data indicate that the shallow groundwater conditions are stable with only slight variations from year to year.

Water management techniques have been utilized within the District since farmed operations began in 1968. In October of 1984, the District adopted its first written water conservation plan. In December 1992, the District adopted a new comprehensive Water Management Plan to fulfill the requirements of the Agricultural Water Management Planning Act of 1986 (AB 1658). In 1999, the District voluntarily elected to update its Water Management Plan to reevaluate

goals and objectives that were previously identified. The proposed canal lining project is consistent with the District's Water Management Plan and is one of the Efficient Water Management Practices identified by the Agricultural Water Management Council.

The project is needed to conserve water and reduce losses to a salt sink. The project will increase the water supply for beneficial use.

Part B-3: Nature, Scope and Objectives of the Project

The objective of the project is to prevent seepage losses to a salt sink. Seepage from the canals contributes to shallow groundwater conditions in the vicinity of the canals. The District has always been concerned with seepage loss from the unlined canals and has conducted various seepage tests in these canals over the years. The District conducted seepage tests on various reaches of the unlined canals in the late 1980s. Additional seepage tests were conducted in 1995 and 1996 and again in 1998. Seepage information was gathered by blocking off reaches of the canal and measuring the water loss after accounting for evaporation losses. The data was analyzed by Provost & Pritchard Engineering Group, Inc., and a report was prepared that summarized the findings and conclusions of the investigation of seepage losses in the unlined canals. The report presented the results of the seepage tests and calculations of daily and annual seepage losses, along with capital cost estimates for two different canal lining alternatives and a calculated benefit/cost ratio for lining the various canals. As a result of the canal seepage study, the District lined approximately 4.6 miles of canal in Service Area 2, which was completed in 1999.

The canal seepage study indicated that by concrete lining Canal 4N and Canal 4S, approximately 250 acre-feet of water per year could be saved that is currently lost to the shallow groundwater table. This seepage water currently contributes to the tile drainwater discharged into the evaporation ponds, and the proposed canal lining project would result in less drainwater collected. By lining Canal 4N and Canal 4S, there is a water savings benefit, a drainage reduction benefit and an environmental benefit from less water in the evaporation ponds. A summary of the seepage calculations for Canal 4N and Canal 4S is shown below:

Canal	Length	Seepage (in/hr)	Seepage	Days Use	Annual Seepage (AF/yr)
4N	4,050'	0.086	0.207	188	39
4S	11,850	0.119	1.101	192	211
Total	15,900				250

The CALFED Agricultural Water Use Efficiency Program has developed a list of Quantifiable Objectives, which are CALFED's estimates of the practical and cost-effective contribution agricultural water use efficiency can make towards goals related to water supply reliability, water quality, and ecosystem restoration.

CALFED has completed 55 Quantifiable Objectives out of the 196 potential Quantifiable Objectives that were identified for the 21 Sub-Regions in the Central Valley. This project is consistent with one of the Quantifiable Objectives that has been completed for Sub-Region 19, Number 188. The Intended Outcome of Quantifiable Objective Number 188 is to "decrease flows to salt sinks to increase the water supply for beneficial uses", with a quantifiable objective of less than 1,000 acre-feet per year. This project would save 250 acre-feet of water annually that is lost to a salt sink, amounting to 25% of the identified Quantifiable Objective.

TECHNICAL/SCIENTIFIC MERIT, FEASIBIILITY, MONITORING & ASSESSMENT

Part B-4: Methods, Procedures and Facilities

The proposed project consists of concrete lining existing unlined canals to reduce seepage losses. Lost Hills Water District has concrete lined many of the unlined canals, the most recent project being completed in 1999. Concrete lining is a standard technique for reducing seepage losses that has been used by many water agencies over the years. Concrete lining has been demonstrated to effectively eliminate over 97% of the seepage from unlined canals and is one of the Efficient Water Management Practices identified by the Agricultural Water Management Council. Replacing the canals with pipeline would be another method to reduce seepage and would also eliminate evaporation losses. However, because of the size of the canals and the delivery rates required, concrete lining is more cost-effective than piping the canals.

Part B-5: Schedule

The proposed project schedule and a quarterly expenditure projection is included as Attachment 1 following this section. Design of the project could begin as soon as a contract is executed, projected to be mid-June, 2001. Construction would begin after the irrigation season ends and would be completed prior to the 2002 irrigation season.

Part B-6: Monitoring and Assessment

Once construction is completed on the proposed canal lining project, the water savings will begin as soon as the project is complete. During the construction phase of the project, construction review will occur to document compliance with the plans and specifications. After construction is complete, a direct measurement of the water savings will not be possible. However, it might be possible to estimate the water savings on an annual basis by comparing the metered delivery records from the Aqueduct to the metered field delivery turnout

records. After accounting for any meter inaccuracy, this will help give an indication of the efficiency of the delivery system and a comparison to historical data might yield an estimate of the annual water savings.

Section C – Outreach, Community Involvement and Information Transfer

Part C-1: Outreach Efforts & Benefits to Disadvantaged Communities

The nearest town to the proposed project is the town of Lost Hills, located near Interstate 5 and Highway 46. Lost Hills is a typical community found in western Kern County, having a predominantly Hispanic population that is dependent on the agricultural economy. The proposed project will benefit Lost Hills and the surrounding area in several ways. First, during the construction project, a general contractor and various subcontractors will have workers on the job site for several months, and it is anticipated that there will be an economic benefit from these workers purchasing goods and services in Lost Hills and the surrounding area. Secondly, the proposed project will help the landowners conserve water and reduce drainage impacts, thereby helping to maintain economic viability.

There are no known tribal entities in the Lost Hills area, so there is no opportunity to involve and extend the benefits of the project to tribal entities.

Part C-2: Training, Employment and Capacity Building Potential

The project will be constructed by a qualified contractor after a competitive bidding process. The number of people that will be employed by the contractor and his subcontractors is not known at this time. It is possible that the contractor and associated subcontractors will have apprentices on the job site that will receive training, however, the amount of training that will occur is unknown at this time.

Part C-3: Disseminating Information

The results of the canal lining project and the promotion of its application will be shared with all interested parties, including the Kern County Water Agency and its members, and the Agricultural Water Management Council, of which the District is a member by virtue of membership by the Agency. It is anticipated that an article about the project would be written for publication in DWR's Water Conservation News newsletter and other appropriate publications.

Part C-4: Notification of Proposal

Lost Hills Water District has discussed the project with the major landowners in Service Area 4 and the landowners are supportive of the project. The District has notified the Kern County Water Agency of its proposal to concrete line canals to reduce losses to salt sinks and increase the beneficial use of the water supply. Kern County Water Agency has submitted a letter of support for the proposal, which is included in the Appendix. The District will be notifying the Regional

Water Quality Control Board of the proposal and it is anticipated that the Regional Board will be supportive of the project because of the drainage reduction benefits associated with the project.

Section D – Qualifications of the Applicants, Cooperators & Establishment of Partnerships

Part D-1: Resumes of Project Managers

The project manager and the contact person for the applicant, Lost Hills Water District, will be the Manager of the District, Phillip D. Nixon. Mr. Nixon will provide project oversight for the canal lining project. Mr. Nixon has been the Manager of the District since 1991 and has overseen numerous construction and maintenance projects within the District that were similar in nature and scope to the proposed project, including the concrete lining of 4.6 miles of canals in Service Area 2 in 1999. Several other projects that Mr. Nixon has overseen include: acquiring, upgrading, operating and maintaining the District's evaporation pond system; and participation in energy curtailment and reduction programs through the Independent System Operator and the California Energy Commission.

The District will utilize their consulting engineer, Provost & Pritchard Engineering Group, Inc., to design the canal lining project and oversee construction. Provost and Pritchard is the largest engineering company in the San Joaquin Valley and has provided design and construction management services on numerous canal lining projects throughout the San Joaquin Valley, including previous canals in Lost Hills Water District. The Provost and Pritchard project manager will be Kevin Johansen, who has been with Provost & Pritchard since 1988. Mr. Johansen's resume is included in the Appendix.

Part D-2: External Cooperators

It is not anticipated that the proposed project would require the involvement of any external cooperators. The District will contract for design services with Provost and Pritchard Engineering Group, Inc. A construction contract will be awarded after a competitive bidding process.

Part D-3: Partnerships

The District will be able to implement the project on its own, and as such, no partnerships are anticipated to be required to implement the project. However, the Kern County Water Agency has informed the District that they would consider partnering with the District on this project to the extent practical, with in-kind services. A letter of support from the Agency is included in the Appendix.

Section E – Costs and Benefits

Part E-1: Budget Summary and Breakdown

It is anticipated that the District will contract for all services regarding the project, including design services, construction, and construction management. The project budget is summarized below.

BUDGET

Salaries & Wages	None[1]	$ 0
Fringe Benefits	None	0
Supplies	None	0
Equipment	None	0
Services/Consultants	See below	0
Travel	None	0
Other Direct Costs	General Contractor [2] (see preliminary engineer's cost estimate in the Appendix)	$ 1,204,740
	Consultant Costs Engineering, Environmental, Surveying, Legal, Administration, Construction Staking, Construction Management	168,660
	TOTAL DIRECT COSTS	$ 1,373,400
Indirect	(0% of total direct costs)	0
	TOTAL ESTIMATED PROJECT COST	**$ 1,373,400**

[1] The majority of work will be performed by contractors and consultants. Lost Hills Water District personnel involved in the project will provide these services in-kind and will not seek reimbursement for their cost of services.

[2] The general contractor will be selected through a competitive bidding process. Estimated construction quantities and cost estimates are detailed in the preliminary engineer's cost estimate found in the Appendix.

A detailed preliminary engineer's cost estimate for the Service Area 4 Distribution System Improvement Project is included in the Appendix. District personnel will provide contract and administrative services and the District landowners have committed to cost share $195,800 as explained in Part E-4.

The grant amount requested from the CALFED Agricultural Water Use Efficiency program therefore is $1,177,600.

Part E-2: Budget Justification

The preliminary engineer's cost estimate included in the Appendix is based on recent construction projects in the area, primarily the District canal lining project that was completed in 1999, adjusted to year 2000 dollars. A contingency of 15% has been added to address unknown costs. Consultant expenses for engineering design services, environmental compliance, surveying, legal and administrative services, construction staking and construction management are estimated to be approximately 14% of the total construction cost.

Part E-3: Benefit Summary and Breakdown

The project has direct benefits to the District and indirect benefits to the CALFED program and other water users. The District will directly benefit in three ways as a result of the project:

Water Conservation: The 250 acre-feet per year of water conserved has an estimated value of approximately $73 per acre-foot, which is the average total cost of District water in Service Area 4 in a "normal" water year. The water conservation benefit to the growers in Service Area 4 is therefore estimated to be $18,250 per year.

Drainage Reduction: The land in Service Area 4 is tile drained and the canal lining project will have a direct impact on drainage discharges to the evaporation ponds. The correlation between canal seepage and tile drain production is not known, however, it can be assumed that the majority of the canal seepage will ultimately be picked up by the tile drain system. For purposes of quantifying a drainage reduction benefit, it is assumed that 75% of the canal seepage becomes tile drain water. Landowners who discharge to the evaporation pond system are charged a drainage fee of $35/acre-foot by the District. The resulting drainage reduction benefit therefore is estimated to be approximately $6,550 per year (250 acre-feet x 75% x $35/acre-foot).

Maintenance Cost Reduction: Review of the District's maintenance costs have determined that the annual maintenance costs for concrete lined canals is approximately $600 per mile less than for unlined canals. This results in a savings of approximately $1,800 less maintenance costs per year as a result of the project versus the current unlined canals. The cost savings are primarily a reduction in weed control chemicals and the labor and equipment to apply the chemicals.

The total direct benefit to the District and the landowners in Service Area 4 from the above identified benefits is therefore approximately $26,600 per year.

Benefits to the CALFED program and other water users are indirect benefits and are difficult to quantify. The proposed project increases the water supply for beneficial use by the District. This in turn reduces the District's and the landowner's needs for transfers and supplemental water purchases, including Article 21 (Interruptible) water deliveries and Turnback water purchases. By reducing the amount of transfers and supplemental water purchases, water can be left in the system for use by the CALFED program or other water users.

Other non-quantified benefits include: reduction of salt loading to the evaporation ponds; reduction of applied herbicides in maintenance activities; and an economic benefit to Lost Hills and the surrounding area as a result of the construction project.

Part E-4: Assessment of Costs and Benefits

The costs of the project are estimated to be $1,373,400 as explained in Part E-1. The direct benefits to the District include a water conservation benefit, a drainage benefit and a maintenance cost reduction benefit and are estimated to total approximately $26,600 per year as explained in Part E-3. The landowners within Service Area 4 desire to see a 10-year payback on any investment they make in the distribution system. The present worth of $26,600 per year in benefits over the next ten years is approximately $195,800 using a 6% discount rate (present worth factor of 7.36).

Therefore the landowners in Service Area 4, and hence the District, are willing to cost share in the amount of $195,800. The costs and benefits of the proposed project are summarized below:

PROJECT COSTS & BENEFITS SUMMARY

Costs	CALFED grant amount	$1,177,600
	LHWD cost share amount	195,800
	Total	$1,373,400

Quantified Benefits		
	Water Conservation	$18,250/yr
	Drainage Reduction	6,550/yr
	Maintenance Cost Reduction	1,800/yr
	Total Annual Benefits	$26,600/yr

Non-quantified Benefits

- Increase the water supply for beneficial uses by CALFED or others.
- Reduced salt loading to evaporation ponds.
- Reduced application of herbicide in maintenance activities.
- Economic benefit to community because of construction project.

LOST HILLS WATER DISTRICT

SERVICE AREA 4 DISTRIBUTION SYSTEM IMPROVEMENT PROJECT

Proposed Project Schedule

		June 2001				July 2001					Aug 2001				Sep 2001					Oct 2001					Nov 2001				Dec 2001					Jan 2002				Feb 2002				Mar 2002					Apr 2002				
Week Beginning (Monday start)		4	11	18	25	2	9	16	23	30	6	13	20	27	3	10	17	24	1	8	15	22	29	5	12	19	26	3	10	17	24	31	7	14	21	28	4	11	18	25	4	11	18	25	1	8	15	22	29
Task 1	Execute Contract																																																
Task 2	Project Initiation																																																
Task 3	Cost-sharing Agreement Letter																																																
Task 4	Survey Canal Alignment																																																
Task 5	Conduct Environmental Review																																																
Task 6	Obtain Environmental Clearance																																																
Task 7	Prepare Design Plans																																																
Task 8	Pepare Project Specifications																																																
Task 9	Advertise Project for Bid																																																
Task 10	Award Project to Contractor																																																
Task 11	Project Construction																																																
Task 12	Accept Completed Project																																																

Quarterly Expenditure Projection:

$40,000	3rd quarter 2001
$100,000	4th quarter 2001
$600,000	1st quarter 2002
$437,600	2nd quarter 2002
$1,177,600	Total CALFED Grant Amount

Attachment 1

EST. 1968
PROVOST & PRITCHARD
ENGINEERING GROUP

Preliminary Engineer's Cost Estimate

Lost Hills Water District
Service Area 4 Distribution System Improvement Project

Item No.	Work or Material	Estimated Quantity	Unit	Unit Price	Amount
1	Move-in, mobilization, bonds & insurance, worker protection, miscellaneous facilities and operations	Lump Sum	LS	$40,000	$40,000
2	Transition from Turnout #4 to Canal 4S and 4N	Lump Sum	LS	$6,000	$6,000
3	Canal 4N Preparation (Remove unsuitable material)	4,050	LF	$1.60	$6,480
4	Canal 4N Earthwork	4,050	LF	$22.00	$89,100
5	Canal 4N Concrete Canal Lining (Assume B=4', D=5')	4,050	LF	$36.00	$145,800
6	Transition to Existing Turnouts on Canal 4N	3	EA	$4,000	$12,000
7	Transition to Lateral 4-1	Lump Sum	LS	$6,000	$6,000
8	Canal 4S Preparation (Remove unsuitable material)	11,850	LF	$1.60	$18,960
9	Canal 4S Earthwork	11,850	LF	$22.00	$260,700
10	Canal 4S Concrete Canal Lining (Assume B=4', D=5')	11,850	LF	$36.00	$426,600
11	Transition to Existing Turnouts on Canal 4S	6	EA	$4,000	$24,000
12	Transition to Lateral 4-2	Lump Sum	LS	$6,000	$6,000
13	Transition to Lateral 4-3	Lump Sum	LS	$6,000	$6,000
	Contingency			15%	$157,100
			CONSTRUCTION SUBTOTAL:		$1,204,740
	Engineering, environmental, surveying, legal, admin., construction staking, construction management			14%	$168,660
			PRELIMINARY COST ESTIMATE:		**$1,373,400**